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SPRUCE BUDWORM

CONTROL PLAN FOR 1951
IN
OREGON AND WASHINGTON

PREPARED BY
SPRUCE BUDWORM ACTION COMMITTEE
PORTLAND, OREGON
OCTOBER 27, 1950

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Entomology and Plant Quarantine
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SPONSORSHIP STATEMENT

The Spruce Budworm Action Committee, having thoroughly reviewed the budworm situation in Oregon and Washington, urges that the control program outlined in this report be carried out in its entirety through the continued cooperative efforts of private, state, and federal agencies. Completion of the proposed program for 1951 should make it possible to bring the entire outbreak under control in 1952. The committee consists of representatives of the following organizations:

Oregon State Board of Forestry
Oregon Extension Service
Washington State Division of Forestry
Washington Forest Fire Association
Forest Conservation Committee of Pacific Northwest Forest Industries
Western Pine Association
Western Forestry and Conservation Association
Western Forest Industries Association
Keep Oregon Green Association
Keep Washington Green Association
Associated Forest Industries of Oregon
Tree Farm Management Service of Oregon
Farm Bureau of Washington
City of Walla Walla, Washington
U. S. Forest Service
U. S. Bureau of Land Management
U. S. Indian Service
U. S. Bureau of Entomology and Plant Quarantine

THE CONTROL PROBLEM

The spruce budworm epidemic in the Douglas-fir and white fir forests of Oregon and Washington now embraces approximately 2,038,000 acres. From a small beginning in 1944 the epidemic steadily increased to 2,276,000 acres by 1949, and then was reduced to 2,038,000 acres by spraying during 1949 and 1950 (Graph 1). The most critical areas, those with heavy populations of the insect and where tree killing was in progress or was imminent, were treated. Due to this treatment the area of heavy epidemic infestation was reduced from 887,000 acres at the end of 1949 to 185,000 acres at the end of 1950. However, there is still a big acreage infested. Further control is essential to prevent the insect population from building up and thus maintain the favorable results of spraying obtained during 1949 and 1950.

The spruce budworm situation is outlined briefly in the following discussion and a detailed plan for control of the epidemic set forth. Because of the immense size of the infested area and the short time available for control because of the habits of the insect, it is not feasible to attempt to control the entire remaining infestation in one year. Accordingly, a 2-year program is planned to effect complete control of the epidemic. The proposed control program for 1951 covers only the most critically infested areas. This proposal is based upon safeguarding the results of the control work already completed and protecting the more valuable timber and watersheds from damage. Federal, private and state timber is involved and these ownerships are closely intermingled. Only by spraying of all ownerships in a joint program can control work be successful.

VALUES BEING PROTECTED

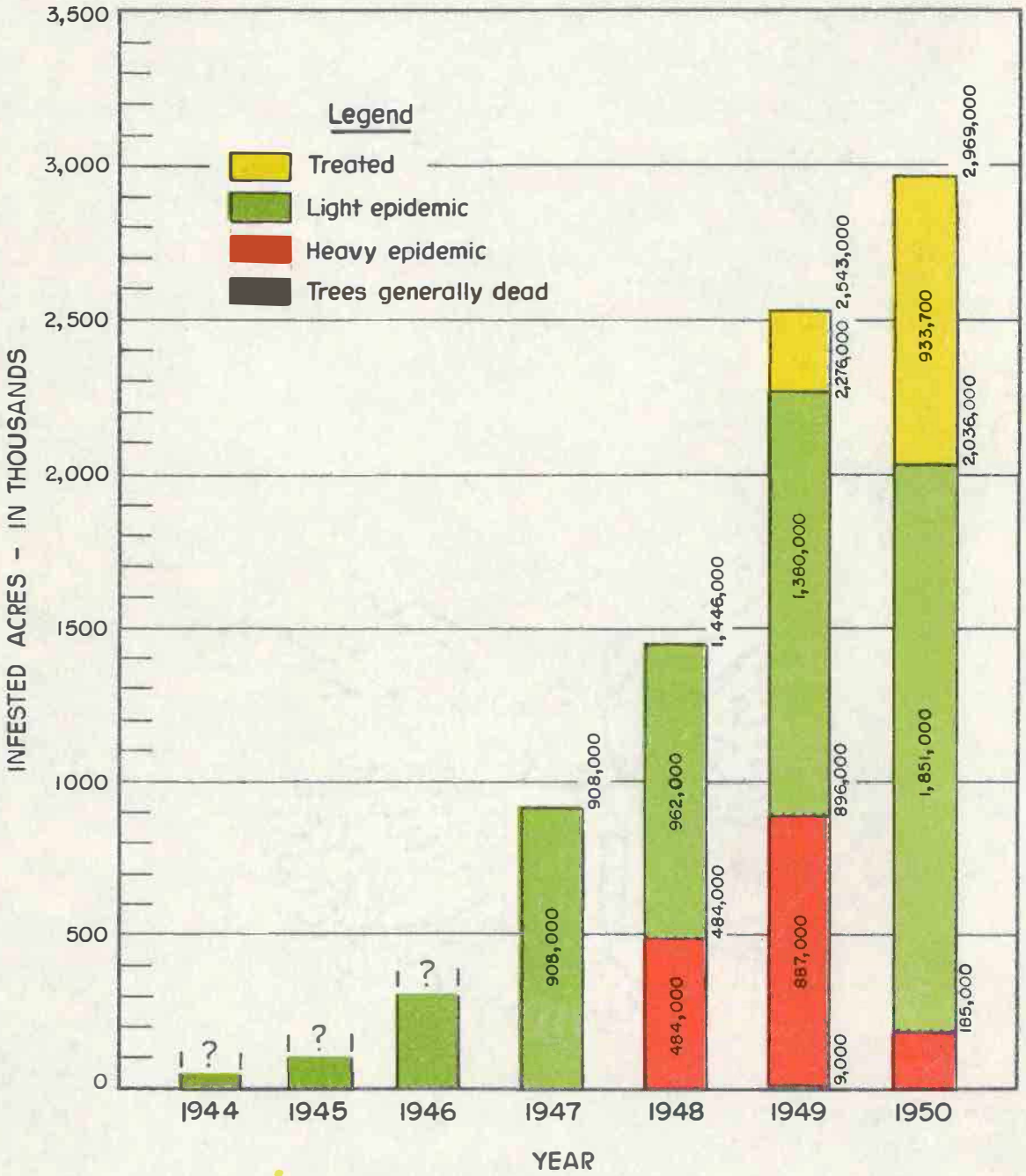
If allowed to go unabated, the spruce budworm epidemic is likely to build up to the point in the Douglas-fir and white fir forests of Oregon and Washington where widespread tree killing will take place. The quarter of a million people who depend upon the wood-using industries of these two states for their direct livelihood cannot afford to take that chance. Neither can the people of the Nation because these two states furnish more than a quarter of all the forest products which the nation consumes each year. The present infestation is seriously threatening timber valued conservatively on the stump at 63 million dollars. Manufactured into forest products at present market prices, these forests represent a value of 1.5 billion dollars. These estimates do not include the even greater value of the threatened timber outside the infested areas.

To date about $1,300,000 has been spent in a successful fight against the spruce budworm. The final benefits to be derived from this expenditure will largely depend upon completion of control in the remaining areas of epidemic infestation.

Another important consideration in the control of the spruce budworm is the forest fire hazard created by dead and dying trees. If the insect were allowed to go uncontrolled and cause wide-scale defoliation

Graph I

PROGRESS OF SPRUCE BUDWORM EPIDEMIC
IN OREGON AND WASHINGTON



and tree killing, the forest fire hazard would be increased to the point where logging operations and grazing and recreational use would have to be curtailed during the fire season. The Federal Government, the states, and the private timber owners have a great sum invested over a 45-year period in fire prevention in the forests now attacked by the budworm. Continuation of the budworm outbreak would seriously threaten this investment in fire prevention by greatly increasing the fire hazard.

Any heavy killing of dense Douglas-fir or white fir forests, which very likely would be followed by fire, might contribute heavily to flood damage, soil erosion, and the lessening of domestic and irrigation water supplies. Much of the budworm infestation occurs in watersheds where the water supply is barely sufficient to meet present needs.

ACCOMPLISHMENTS OF CONTROL

In the spring of 1949, 267,000 acres of the most critical spruce budworm infestation in Oregon were successfully sprayed. Approximately 97 percent of the spruce budworm larvae were killed and the epidemic halted in the areas treated.

In the spring of 1950, 933,700 acres were treated in Oregon and Washington with an average kill in the treated areas of 99 percent of the spruce budworm larvae.

The aerial spraying during the past two years has demonstrated for the first time that an extensive outbreak of the spruce budworm can be effectively and economically controlled. The over-all extent of the outbreak has been cut down at a time when the natural tendency was toward increase, and the areas of critical infestation have been greatly reduced. The remaining job of control, although still large, is a feasible undertaking that should be completed by 1952.

The large-scale control work of 1949 and 1950 has furnished the technical and administrative experience on which the control program for 1951 is based. Contractual procedures have been established; cooperative financing and administration under the state and federal forest pest control acts have been worked out; insecticides, airplanes and spraying equipment have been tested; trained personnel is available and all necessary organizational details for successfully carrying on a large control project have been worked out by the state and federal agencies concerned.

The 1950 control work on 933,700 acres was done at a cost ranging from $0.86 to $1.36 per acre for individual control units, and at an average over-all cost of $1.06 per acre for the entire project. About 62% of the sprayed acres was in federal ownership and 38% in state and private. The federal expenditure for direct spraying costs totaled $712,035 out of an appropriation of $750,000. The States of Oregon and Washington and the private timber owners spent $275,186. This is a total of $987,221 for the project.

The 1950 control program was set up on the basis of an estimated cost of $1.20 per acre. The actual cost of $1.06 per acre was effected by economies in all phases of the work. It enabled the spraying of a correspondingly larger acreage. Because of fatalities in 1950, increased safety precautions will be required of all the aerial spraying contractors in the 1951 control program. These requirements, plus general increases in the costs of materials and services, are expected to increase the over-all spraying costs, despite material economies that can be made along some lines as a result of experimental findings in 1950. Careful estimates indicate that spraying costs in 1951 will approximate $1.15 per acre, and it is on that basis that the project costs for 1951 are estimated.

1950 SURVEY RESULTS

The status of the spruce budworm epidemic in Oregon and Washington is summarized in table 1 in this report and is given in detail in a recent report[1/] covering the survey of 1950. Epidemic infestation of the budworm totals 2,037,890 acres by areas as follows:

Western Oregon	93,320	acres
Eastern Oregon Cascades	107,540	acres
Blue Mountains in Oregon	1,514,710	acres
Blue Mountains in Washington	295,520	acres
Eastern Washington Cascades	26,800	acres
Total	2,037,890	acres

The spruce budworm situation in Oregon and Washington was determined from a comprehensive aerial and ground survey conducted during the period June 15 - September 22, 1950. This cooperative survey, participated in by 132 private, state and federal foresters and entomologists, covered 48.2 million acres. More than 26,000 air miles were flown and 4,083 check plots were examined on the ground. In addition, detailed studies of the budworm were made in representative parts of the region.

1/ Report of Forest Insect Detection Surveys in Oregon and Washington, Season of 1950. Prepared by Oregon State Board of Forestry and U. S. Bureau of Entomology and Plant Quarantine. Sept. 30, 1950.

RECOMMENDATIONS

Much progress has been made in protecting the fir forests of Oregon and Washington from devastation by the spruce budworm. Control efforts in 1949 and 1950 have prevented extensive timber killing and proved the practicability of aerial spraying for control of the budworm. Despite the success that has been achieved, over two million acres of infestation remain and a vigorous control program is still urgently needed.

In the 1950 control program 933,702 acres were sprayed, and highly satisfactory results were achieved. While this was an enormous undertaking, efficient administration was possible. Supplies, equipment, and services were obtained in time and in the amounts necessary to complete the scheduled program.

It is recommended, therefore, that a program of similar size be undertaken in 1951. A 1,000,000-acre control project would be administratively practical, and would provide reasonable progress toward completing the control job in 1952.

Areas to be Treated

Since only about half of the currently epidemic infestation can be treated in 1951, the committee recommends that first consideration be given to:

1. Infested areas near or adjacent to control areas of 1950 which, if left uncontrolled, might reinfest the treated areas.

2. Areas of new infestation in western Oregon and in the Eastern Oregon Cascades which might serve as centers of further spread in these localities.

3. Areas in the Blue Mountains and the Eastern Washington Cascades which are heavily infested and in which tree killing is imminent or in progress.

The proposed 1951 program is presented in detail in table 2. The program by acreages and ownerships for both Oregon and Washington is as follows:

Federal	676,380 acres (66.8%)
Private	328,130 acres (32.4%)
State and County	8,230 acres (0.8%)
Total	1,012,740 acres (100%)

By states this acreage is divided as follows:

Oregon	896,820 acres
Washington	115,920 acres

The infestations to be sprayed in 1951 are divided into 13 units as shown in table 2 and on the map. In addition, there are 5 units in which no spraying is planned for 1951 for reasons that are explained in the section of the report entitled "Control Unit Data".

Apportionment of Costs

The proposed apportionment of project costs for 1951 among the various land owners is based upon the formula used in the 1949 and 1950 projects, and is as follows:

1. Federal Government: The full costs of the treatment of federal lands, which for the 1951 project are as follows:

National Forest	618,510 acres
Public Domain	6,440 "
Indian Lands	51,430 "
Total-Federal	676,380 acres

In addition, 25% of the costs of treatment of the private lands will be paid from federal funds.

2. States of Oregon and Washington: The full costs for the treatment of the state and county lands, and 50% of the cost of the treatment of private lands.

3. Private Owners: 25% of the cost of treatment of private lands.

The cost of the project in accordance with the above apportionment and an estimated cost of $1.15 per acre is shown in detail in table 3. These costs, briefly stated, are as follows:

Federal:

For federal lands	$777,836
For private lands	94,338
Total federal funds required	$872,174

States of Oregon and Washington:

For state and county lands	$ 9,465
For private lands	188,674
Total state funds required	$198,139

Private Owners

For private lands	$ 94,338
Total Project Cost	$1,164,651

The availability of the funds to carry the states' share of the project costs ($198,139) will be determined by the action of the state legislatures early in this winter. The private timber owners concerned are taking the same deep interest in the 1951 project as they showed in the 1949 and 1950 work and their support is assured.

The necessity for early action on the required federal appropriation of $872,174 can not be overemphasized. Careful planning and efforts to secure insecticides and satisfactory services at the lowest possible prices, through competitive bidding, are dependent on early appropriations. The uncertainty of an adequate DDT supply and the probable shortages of qualified pilots for the spraying work make the early issuance of bid invitations and reasonably prompt firm awards highly desirable in the interest of low costs and effective work.

Project Administration

The effective spraying of 933,702 acres in 1950 at an average cost of only $1.06 per acre is ample evidence of the desirability of doing the job in 1951 in essentially the same manner as in 1950. It is recommended, therefore, that the States of Oregon and Washington and the Forest Service divide the administration of the spraying in the manner indicated in table 4. By this arrangement, the federal government will be responsible for the spraying of 534,650 acres included in five units in which 83.6 percent of the ownership is federal. The State of Oregon will undertake the spraying of 468,090 acres in seven units in which 52.1 percent of the ownership is state and private. For the first time, the State of Washington will assume the responsibility of spraying a unit, the Wenatchee unit of 10,000 acres, some 46.5 percent of which is privately owned.

The spraying of private, county and state timber by the federal government will again be handled by cooperative agreement and a repayment plan between the States of Oregon and Washington and the Forest Service. Similar cooperative agreements will be executed for the spraying of federal lands by the States of Oregon and Washington.

It is recommended also that the U. S. Bureau of Entomology and Plant Quarantine continue to supervise, coordinate and inspect the technical phases of the control work. It is further recommended that the various agencies concerned again inspect each other's work while it is in progress in the interest of the accomplishment of good work at lowest possible costs.

Research

A three-year program of research, beginning in 1948, led first to a practical method for controlling the budworm and then to increased effectiveness and decreased costs of control. Much less attention has been given to a study of the budworm. Since natural control factors must in the long run be depended upon to effect lasting control of the budworm, it is urged that increased emphasis be placed upon fundamental studies of the budworm in the Pacific Northwest.

CONTROL UNIT DATA

Conditions on the 2,038,000 acres now harboring epidemic infestation of the budworm are widely variable. Accordingly, it has been necessary to consider many factors in formulating the proposed control program. The entire epidemic area has been subdivided into eighteen prospective control units. These units are outlined on the accompanying map, and the detailed basis for control is discussed in the following text. Acreages, ownerships, and spraying costs are given by units in the four tables previously mentioned.

Western Oregon Area

There are two control units in the Western Oregon area - Roseburg and Willamette. Combined, these units contain 93,320 acres of epidemic budworm infestation.

Control was initiated in 1949 with the aerial spraying of 161,000 acres. An additional 120,000 acres were treated in 1950. In each case nearly 100 percent kill of the budworm was obtained where the spraying was done. On the unsprayed areas the outbreak continues to be aggressive with no signs of natural decline.

Timber values in and near the control units in western Oregon are very great. It is estimated that the 93,320 acres of currently infested timber average at least 20,000 board feet per acre. At a conservative valuation of $15.00 per thousand board feet the stumpage value of the infested timber is about $28,000,000. Even greater values are threatened by the possible spread of the epidemic to the surrounding timber.

The experience gained during the past two years shows that control should be extended well beyond the edges of the conspicuously epidemic infestation to prevent spread of the outbreak. Accordingly, it is proposed that a buffer zone around the recorded epidemic infestation be treated to forestall probable spread and thereby hasten the time when complete control of the outbreak will be effected. The total area proposed for control is 135,240 acres, of which 10,300 acres are heavy epidemic, 83,020 acres are light epidemic, and 41,920 acres are buffer zone. Ownership is 94.0 percent (127,070 acres) National Forest, and 6.0 percent (8,170 acres) private.

(1) Roseburg Unit - The spraying of 23,600 acres in 1950 to prevent the spread of this potentially dangerous outbreak practically eliminated the epidemic infestation. Only 1,890 acres in two small centers need to be treated in 1951. Although the affected timber, all in private ownership, is of low value, it is highly important that this relatively small mopping up job be completed in 1951 to safeguard the high-value timber on the surrounding area.

(2) Willamette Unit - The Willamette Unit includes both the Eugene-Oakridge Unit and the McKenzie-Willamette Unit of the 1950 control program. Epidemic infestation on the former Eugene-Oakridge Unit was completely suppressed by the spraying of 161,000 acres in 1949 and a cleanup on

10,000 acres in 1950. Despite the spraying of 92,000 acres on the former McKenzie-Willamette Unit in 1950, the outbreak spread to an additional 91,430 acres. The lesson drawn from this is to block out the control work rather than restrict it to narrowly defined boundaries of epidemic infestation.

The infested timber is predominantly commercial second growth of good quality. Some old-growth stands are infested and more are threatened. Because of the great values involved, it is of the utmost importance that complete control on the Willamette Unit be effected at the earliest possible time. Ownership of the control area is 95.3 percent (127,070 acres) National Forest and 4.7 percent (6,280 acres) private.

Eastern Oregon Cascades Area

There are two control units in the Eastern Oregon Cascade Area - Deschutes and Mt. Hood. The combined epidemic area is 107,540 acres. Outside of the epidemic centers the budworm is rather generally present, as determined by the extensive ground survey. On the epidemic areas the budworm population is very heavy and shows a marked tendency to increase and spread. This outbreak is a serious threat to the highly valuable fir forests of western Oregon.

Control was begun in 1949 with the spraying of 106,000 acres. An additional 40,340 acres were treated in 1950. Practically all the budworms were killed on the sprayed areas, but, because of the strong upward trend on the unsprayed areas, the acreage still needing treatment is large. Experience has shown a need for more blocking up of the control units and extending the control boundaries beyond the recorded epidemic infestation to prevent spread of the outbreak to new areas and reinfestation of treated areas.

It is recommended that an all-out effort be made to clean up the epidemic infestation on this area in 1951. The proposal is to treat a total of 176,980 acres comprising 10,460 acres of heavy epidemic infestation, 97,080 acres of light epidemic infestation, and 69,440 acres of buffer zone. Ownership is 91.9 percent federal and 8.1 percent state and private.

On the average the fir volume on the control area runs about 5,000 board feet per acre with a conservative stumpage value of $3.50 per thousand board feet, or a total value in excess of $3,000,000. On portions of the area the fir ranges from 20,000 to 30,000 board feet per acre and compares favorably in quality and value with the Douglas-fir stands of western Oregon.

(3) Deschutes Unit - For administrative purposes this unit has been expanded to include the southern portion of the Mt. Hood Unit of 1949 and 1950. Spread of the infestation has been both from the adjoining Mt. Hood Unit, where 106,000 acres were treated in 1949 and 35,455 acres in 1950, and from within the Deschutes Unit, where 4,880 acres

were treated in 1950. The epidemic infestation now stands at 89,050 acres, including a new and potentially very serious center near Sisi Butte on the west side of the Cascade Summit. The Deschutes outbreak is at present the most rapidly expanding one in Oregon and Washington.

Because of the aggressiveness of this outbreak, the threat to the Douglas-fir region proper, and the value of the timber already infested, it is proposed that a strenuous effort be made to effect complete control in 1951 through the spraying of 135,450 acres, of which 9,900 acres are heavy epidemic infestation, 79,150 acres are light epidemic infestation, and 46,400 acres are buffer zone. Ownership is 56.6 percent (76,640 acres) National Forest, 37.9 percent (51,390 acres) Indian lands, and 5.5 percent (7,420 acres) private.

(4) Mt. Hood Unit - The epidemic infestation in this unit consists of two centers totalling 18,490 acres in the Mill Creek and Jordan Creek drainages. These centers adjoin and partially overlap the treated area on which 106,000 acres were sprayed in 1949 and 35,455 acres were sprayed in 1950. The continued development of these centers is attributed in part to the fact that control in 1949 had to be delayed so long for lack of funds that some of the budworms matured and escaped. In addition there has been a marked increase in the budworm population on previously nonepidemic areas adjacent to the sprayed area.

As in the Deschutes Unit and in western Oregon, experience in the Mt. Hood Unit has shown a need to block out the control areas rather than confine them exclusively to the conspicuously epidemic centers. It is recommended that a total of 41,530 acres be treated in 1951 to protect the valuable timber, recreational, and watershed values in which a considerable expenditure of control money has already been made. The proposed control area consists of 560 acres of heavy epidemic infestation, 17,930 acres of light epidemic infestation, and 23,040 acres of buffer zone. Ownership is 83.3 percent (34,590 acres) National Forest, and 16.7 percent (6,940 acres) county and private.

Blue Mountains, Oregon, Area

The Blue Mountains of Oregon still harbor by far the most extensive infestation of the spruce budworm. In 1950 the spraying of 773,634 acres controlled the budworm on a large share of the most critically defoliated areas and greatly reduced the over-all extent of the outbreak. The spraying work was aided to some extent by natural control in the easternmost portions of the area. Despite these encouraging developments, some 1,810,230 acres of epidemic infestation still remain, much of it in need of early control.

On the basis of an average volume of 5,000 board feet per acre and $3.00 per thousand board feet stumpage value, the total value of the infested fir timber is over $27,000,000. The outbreak has already created a serious fire hazard that is a direct threat to the timber, watershed and recreational resources of the area.

During 1951 it is proposed to continue the program already well under way by treating the heavily infested centers and such other areas as are necessary to protect the areas that have been sprayed. By the end of the 1951 spraying season the bulk of the most urgently needed control work in the Blue Mountains should be completed. Ownership of the area scheduled for control in 1951 is 56.3 percent federal and 43.7 percent state and private.

(5) Waterman Unit - Epidemic infestation on this unit was first found in 1950. At present the outbreak covers 24,000 acres, of which 13,600 acres are heavy epidemic, and 10,400 acres are light epidemic. Ownership is 10.5 percent (2,520 acres) public domain, and 89.5 percent (21,480 acres) state, private and other. Because of the intensity of this outbreak and the possible threat to the sprayed areas to the north, control measures are recommended for 1951.

(6) Kinzua Unit - This is a westward extension of the South Umatilla Unit of 1950, on which 169,240 acres were sprayed. Treatment of 89,440 acres in 1951 is recommended to protect the commercially valuable fir forests of this unit and also to safeguard the control investment already made on the adjoining area to the east. The proposed program will clean up the entire epidemic infestation in this unit. Ownership is 36.0 percent (32,160 acres) National Forest, 0.1 percent (120 acres) public domain, and 63.9 percent (57,160 acres) state, private and other.

(7) Willow Creek Unit - The Willow Creek Unit is a 77,440-acre island of epidemic infestation that directly threatens the 300,000-acre area that was controlled in 1950 on the former South Umatilla Unit. There are 40,320 acres of heavy epidemic infestation and 37,120 acres of light infestation, all of which are proposed for treatment in 1951 to complete blocking out the control program in this part of the Blue Mountains. Ownership on the control area is 54.5 percent (42,120 acres) National Forest, 0.4 percent (360 acres) public domain, and 45.1 percent (34,960 acres) state, private and other.

(8) Pendleton Unit - This is a 388,630-acre block of untreated infestation lying between the North Umatilla and South Umatilla control units of 1950. There are 28,640 acres of heavy epidemic infestation and 359,990 acres of light epidemic infestation. It is proposed that 184,320 acres of the most heavily infested area be treated, with special emphasis on the protection of the adjoining areas that were treated in 1950. Ownership on the control area is 63.5 percent (116,980 acres) National Forest, 0.3 percent (640 acres) public domain, and 36.2 percent (66,660 acres) state, private and other.

(9) LaGrande Unit - The current LaGrande Unit is restricted to the western portion of the LaGrande Unit of 1950. As now defined, the unit contains a total epidemic infestation of 58,880 acres. It is proposed to treat 26,240 acres of the most heavily infested areas in 1951 to prevent reinfestation of the areas treated in 1950 and to give full

protection to the watershed of the City of LaGrande. Ownership on the control area is 14.3 percent (3,760 acres) National Forest, 3.5 percent (920 acres) public domain, and 82.2 percent (21,560 acres) state, private and other.

(10) Minam Unit - The Minam Unit consists of the southwestern portion of the Enterprise Unit of 1950. A total of 138,560 acres harbor epidemic infestation, of which 25,600 acres are heavy and 112,960 acres are light. Control of 64,760 acres of the heaviest infestation in the vicinity of Elgin is proposed for 1951. The eastern portions of the unit are being left in the hope that natural control developing farther east may soon take effect on this area. Ownership of the area scheduled for control is 35.6 percent (23,040 acres) National Forest, 2.0 percent (1,280 acres) public domain, and 62.4 percent (40,440 acres) state, private and other.

(11) Elgin Unit - This unit consists of the untreated portions of the former North Umatilla Unit, plus a small untreated area in the western part of the former Enterprise Unit. It is continuous with the present Walla Walla Unit in Washington. The total current epidemic infestation is 209,440 acres, of which 17,920 acres are heavy and 191,520 acres are light. It is recommended that 118,400 acres comprising the most heavily infested portions of the unit be treated in 1951 with special emphasis on the protection of the areas sprayed in 1950. Ownership of the control area is 88.9 percent (105,280 acres) National Forest, and 11.1 percent (13,120 acres) state, private and other.

(12) Ochoco Unit - Epidemic infestation in the fir forests of the Ochoco National Forest has been variable, flaring up and dropping down without causing much damage. At present there are 63,840 acres of light epidemic infestation, mostly in the northern part of the forest. Because of more pressing need elsewhere and because of the past record of infestation, no control measures on the Ochoco Unit are recommended for 1951.

(13) John Day Unit - The trend of budworm infestation on this unit has been steadily upward since 1947. At present there are 158,400 acres of epidemic infestation of which 4,480 acres are heavy. Since the critically infested acreage is still small and the needs on other areas are greater, no control is recommended for the John Day Unit in 1951.

(14) Snake River Unit - This unit consists of the extreme eastern portions of the Enterprise and LaGrande Units of 1950. Epidemic infestation totals 143,680 acres, all of which is in the light category. During the 1950 season, there were signs of natural control taking effect on the budworm population in the Snake River Unit. Because of this occurrence, and the additional facts that the intensity of infestation is generally low and the timber values not great, no control is recommended for 1951.

(15) Wallowa Unit - This unit comprises the Chesnimnus Unit and the northern part of the Enterprise Unit of 1950. The current epidemic infestation totals 162,400 acres, of which 10,240 acres are heavy and 152,160 acres are light. The most notable feature of the 1950 infestation was a definite break in the epidemic, attributed in part to natural control and

in part to the spraying of 30,076 acres on the Day Ridge portion of the unit. Since natural control ultimately must be depended upon to effect lasting control of the entire budworm outbreak, it is considered highly important to withhold spraying from this unit in 1951 to see whether natural control develops and spreads to other areas.

Blue Mountains, Washington, Area

This area, although continuous with the Blue Mountains, Oregon, area and presenting essentially the same problems, is set up separately for administrative reasons. It consists of one control unit. The stumpage value of the infested timber is estimated to be about $4,500,000 on the same basis as for the Blue Mountains area in Oregon. Control was initiated in 1950 on 25,853 acres to protect community watersheds and the increasingly important fir timber resources of the area.

(16) Walla Walla Unit - Epidemic infestation on this unit totals 295,520 acres, of which 23,680 acres are heavily defoliated and 271,840 acres are in the light epidemic status. The attacked stands are of greatest value for watershed protection, but are of increasing value for timber production. It is proposed to spray 105,920 acres in 1951. The emphasis will be upon the control of infestation on the most heavily defoliated areas and in the prevention of spread to the previously treated area. Ownership of the control area is 48.6 percent (51,520 acres) National Forest, 0.6 percent (600 acres) public domain, and 50.8 percent (53,800 acres) state, private and other.

Eastern Washington Cascades Area

The budworm epidemic that was present on the Chelan National Forest during the years 1943 to 1948 subsided without appreciable loss of timber. In 1949 the region-wide survey revealed no epidemic infestation in the Eastern Washington Cascades area. At present there is a total of 26,800 acres of epidemic infestation on the Chelan and Wenatchee National Forests. These infestations are as yet too new for tree-killing to have developed. On the basis of an average fir stand of 5000 board feet per acre and a stumpage value of $3.00 per thousand board feet the value of the attacked timber is approximately $400,000.

(17) Wenatchee Unit - Infestation on this unit occurs in one 10,000-acre block of light epidemic infestation in the Icicle Creek drainage. Ownership is 53.5 percent (5,350 acres) National Forest, and 46.5 percent (4,650 acres) private. Control on the entire infested area is recommended because the outbreak, although small, has flared up rapidly and poses a threat to the surrounding timber that is in heavy demand for local manufacture, especially in the wooden box industry.

(18) Chelan Unit - The outbreak consists of two centers totalling 16,800 acres, of light epidemic infestation in relatively low quality stands from which much of the merchantable timber already has been removed. Ownership is 92.4 percent (15,520 acres) federal, and 7.6 percent (1,280 acres) state, private and other. In view of the history of the budworm in this vicinity and because of the low values involved, no control work is recommended for 1951.

TABLE 1 STATUS OF SPRUCE BUDWORM EPIDEMIC IN OREGON AND WASHINGTON

AREAS AND UNITS	ACREAGE				SPRAYING SCHEDULE	
	Light Epidemic	Heavy Epidemic	Buffer Zone	Total	1951 (acres)	Later (acres)
WESTERN OREGON						
(1) Roseburg	1,890			1,890	1,890	
(2) Willamette	81,130	10,300	41,920	133,350	133,350	
Total	83,020	10,300	41,920	135,240	135,240	
EASTERN OREGON CASCADES						
(3) Deschutes	79,150	9,900	46,400	135,450	135,450	
(4) Mt. Hood	17,930	560	23,040	41,530	41,530	
Total	97,080	10,460	69,440	176,980	176,980	
BLUE MOUNTAINS-OREGON						
(5) Waterman	10,400	13,600		24,000	24,000	
(6) Kinzua	89,440			89,440	89,440	
(7) Willow Creek	37,120	40,320		77,440	77,440	
(8) Pendleton	359,990	28,640		388,630	184,320	204,310
(9) LaGrande	54,560	4,320		58,880	26,240	32,640
(10) Minam	112,960	25,600		138,560	64,760	73,800
(11) Elgin	191,520	17,920		209,440	118,400	91,040
(12) Ochoco	63,840			63,840		63,840
(13) John Day	153,920	4,480		158,400		158,400
(14) Snake River	143,680			143,680		143,680
(15) Wallowa	152,160	10,240		162,400		162,400
Total	1,369,590	145,120		1,514,710	584,600	930,110
TOTAL FOR OREGON	1,549,690	165,880	111,360	1,826,930	896,820	930,110
BLUE MOUNTAINS-WASHINGTON						
(16) Walla Walla	271,840	23,680		295,520	105,920	189,600
EASTERN WASHINGTON CASCADES						
(17) Wenatchee	10,000			10,000	10,000	
(18) Chelan	16,800			16,800		16,800
Total	26,800			26,800	10,000	16,800
TOTAL FOR WASHINGTON	298,640	23,680		322,320	115,920	206,400
GRAND TOTAL	1,848,330	189,560	111,360	2,149,250	1,012,740	1,136,510

TABLE 2 PROPOSED PROGRAM FOR SPRUCE BUDWORM CONTROL IN 1951 BY OWNERSHIPS AND AREAS

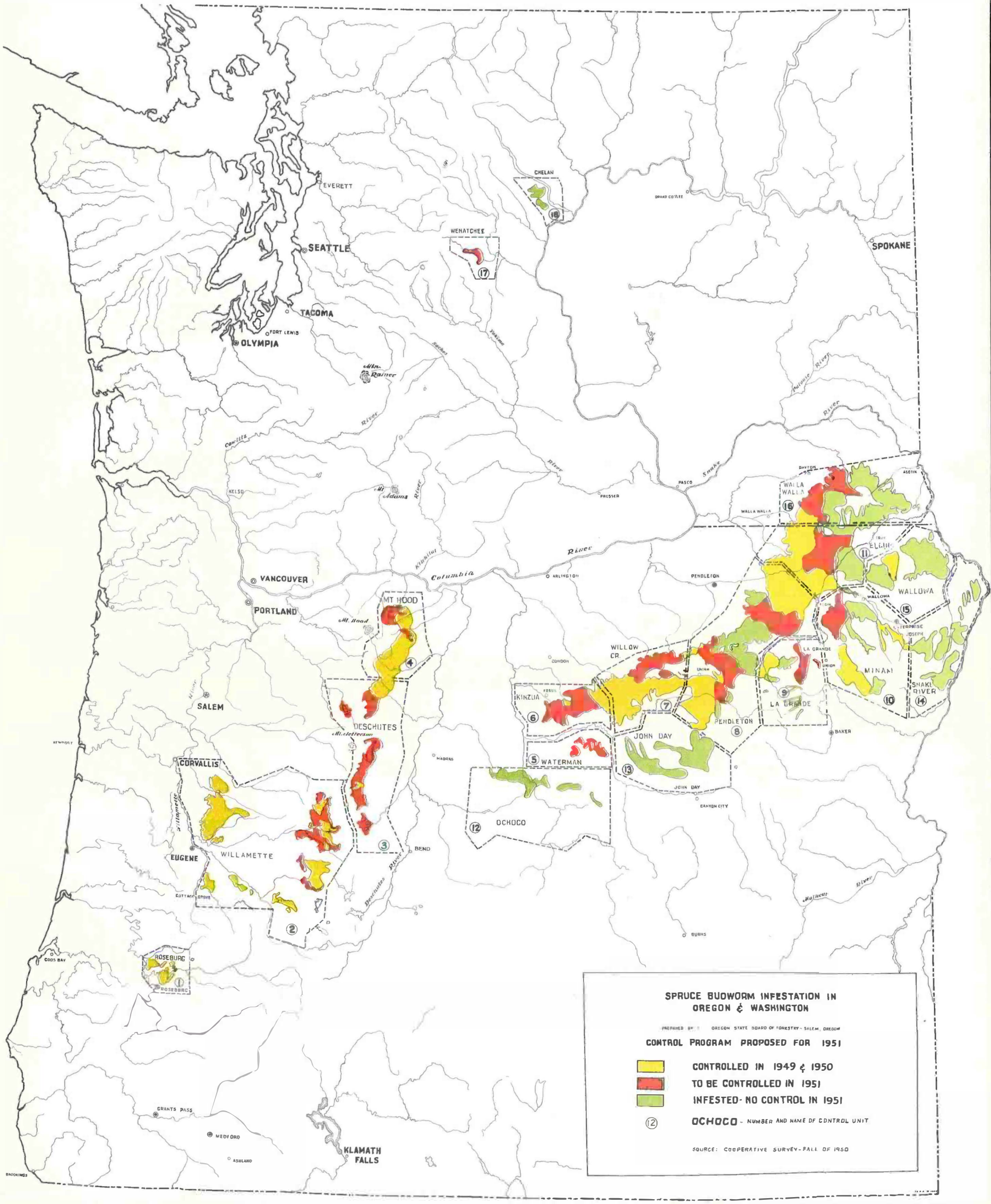
Areas and Units	FEDERAL					STATE & COUNTY		PRIVATE		GRAND TOTAL
	National Forest (Acres)	Public Domain & O&C (Acres)	Indian Reservations (Acres)	Total (Acres)	Percent of Total	(Acres)	Percent of Total	(Acres)	Percent of Total	(Acres)
WESTERN OREGON										
(1) Roseburg								1,890	100.0	1,890
(2) Willamette	127,070			127,070	95.3			6,280	4.7	133,350
Total	127,070			127,070	94.0			8,170	6.0	135,240
EASTERN OREGON CASCADES										
(3) Deschutes	76,640		51,390	128,030	94.5			7,420	5.5	135,450
(4) Mt. Hood	34,590			34,590	83.3	40	.1	6,900	16.6	41,530
Total	111,230		51,390	162,620	91.9	40	.0	14,320	8.1	176,980
BLUE MOUNTAINS-OREGON										
(5) Waterman		2,520		2,520	10.5	440	1.8	21,040	87.7	24,000
(6) Kinzua	32,160	120		32,280	36.1	170	.2	56,990	63.7	89,440
(7) Willow Creek	42,120	360		42,480	54.9	320	.4	34,640	44.7	77,440
(8) Pendleton	116,980	640	40	117,660	63.8	940	.5	65,720	35.7	184,320
(9) La Grande	3,760	920		4,680	17.8	80	.3	21,480	81.9	26,240
(10) Minam	23,040	1,280		24,320	37.6	2,420	3.7	38,020	58.7	64,760
(11) Elgin	105,280			105,280	88.9	500	.4	12,620	10.7	118,400
(12) Ochoco										
(13) John Day										
(14) Snake River										
(15) Wallowa										
Total	323,340	5,840	40	329,220	56.3	4,870	.8	250,510	42.9	584,600
TOTAL FOR OREGON	561,640	5,840	51,430	618,910	69.0	4,910	.6	273,000	30.4	896,820
BLUE MOUNTAINS-WASHINGTON										
(16) Walla Walla	51,520	600		52,120	49.2	3,320	3.1	50,480	47.7	105,920
EASTERN WASHINGTON CASCADES										
(17) Wenatchee	5,350			5,350	53.5			4,650	46.5	10,000
(18) Chelan										
Total	5,350			5,350	53.5			4,650	46.5	10,000
TOTAL FOR WASHINGTON	56,870	600		57,470	49.6	3,320	2.9	55,130	47.5	115,920
GRAND TOTAL	618,510	6,440	51,430	676,380	66.8	8,230	0.8	328,130	32.4	1,012,740

TABLE 3 PROPOSED APPORTIONMENT OF COSTS FOR SPRUCE BUDWORM CONTROL IN 1951

AREAS AND UNITS	FEDERAL COSTS			STATE COSTS			PRIVATE COSTS	GRAND TOTAL
	For U.S. Land (100%)	For Private Lands (25%)	Total	State & County (100%)	For Private Lands (50%)	Total	For Private Lands (25%)	
WESTERN OREGON								
(1) Roseburg		$543	$543		$1,088	$1,088	$543	$2,173
(2) Willamette	$146,130	1,806	147,936		3,610	3,610	1,806	153,353
Total	$146,130	$2,349	$148,479		$4,698	$4,698	$2,349	$155,526
EASTERN OREGON CASCADES								
(3) Deschutes	$147,235	$2,133	$149,368		$4,266	$4,266	$2,133	$155,767
(4) Mt. Hood	39,779	1,984	41,763	$46	3,967	4,013	1,984	47,760
Total	$187,014	$4,117	$191,131	$46	$8,233	$8,279	$4,117	$203,527
BLUE MOUNTAINS-OREGON								
(5) Waterman	$2,898	$6,049	$8,947	$506	$12,098	$12,604	$6,049	$27,600
(6) Kinzua	37,121	16,385	53,506	196	32,769	32,965	16,385	102,856
(7) Willow Creek	48,852	9,959	58,811	368	19,918	20,286	9,959	89,056
(8) Pendleton	135,309	18,894	154,203	1,081	37,789	38,870	18,894	211,967
(9) La Grande	5,382	6,176	11,558	92	12,350	12,442	6,176	30,176
(10) Minam	27,968	10,931	38,899	2,783	21,862	24,645	10,931	74,475
(11) Elgin	121,072	3,628	124,700	575	7,257	7,832	3,628	136,160
(12) Ochoco								
(13) John Day								
(14) Snake River								
(15) Wallowa								
Total	$378,602	$72,022	$450,624	$5,601	$144,043	$149,644	$72,022	$672,290
TOTAL FOR OREGON	$711,746	$78,488	$790,234	$5,647	$156,974	$162,621	$78,488	$1,031,343
BLUE MOUNTAINS-WASHINGTON								
(16) Walla Walla	$59,938	$14,513	$74,451	$3,818	$29,026	$32,844	$14,513	$121,808
EASTERN WASHINGTON CASCADES								
(17) Wenatchee	$6,152	$1,337	$7,489		$2,674	$2,674	$1,337	$11,500
(18) Chelan								
Total	$6,152	$1,337	$7,489		$2,674	$2,674	$1,337	$11,500
TOTAL FOR WASHINGTON	$66,090	$15,850	$81,940	$3,818	$31,700	$35,518	$15,850	$133,308
GRAND TOTAL	$777,836	$94,338	$872,174	$9,465	$188,674	$198,139	$94,338	$1,164,651

TABLE 4 PROPOSED PROJECT ADMINISTRATION FOR SPRUCE BUDWORM CONTROL IN 1951

ADMINISTRATIVE AGENCY		UNITS	FEDERAL ACREAGE	PERCENT OF TOTAL	STATE & COUNTY ACREAGE	PERCENT OF TOTAL	PRIVATE ACREAGE	PERCENT OF TOTAL	TOTAL ACREAGE
U. S. Government	(2)	Willamette	127,070	95.3			6,280	4.7	133,350
" " "	(3)	Deschutes	128,030	94.5			7,420	5.5	135,450
" " "	(4)	Mt. Hood	34,590	83.3	40	.1	6,900	16.6	41,530
" " "	(11)	Elgin	105,280	88.9	500	.4	12,620	10.7	118,400
" " "	(16)	Walla Walla	52,120	49.2	3,320	3.1	50,480	47.7	105,920
		TOTAL ACRES	447,090	83.6	3,860	.7	83,700	15.7	534,650
State of Oregon	(1)	Roseburg					1,890	100.0	1,890
" " "	(5)	Waterman	2,520	10.5	440	1.8	21,040	87.7	24,000
" " "	(6)	Kinzua	32,280	36.1	170	.2	56,990	63.7	89,440
" " "	(7)	Willow Creek	42,480	54.9	320	.4	34,640	44.7	77,440
" " "	(8)	Pendleton	117,660	63.8	940	.5	65,720	35.7	184,320
" " "	(9)	La Grande	4,680	17.8	80	.3	21,480	81.9	26,240
" " "	(10)	Minam	24,320	37.6	2,420	3.7	38,020	58.7	64,760
		TOTAL ACRES	223,940	47.9	4,370	.9	239,780	51.2	468,090
State of Washington	(17)	Wenatchee	5,350	53.5			4,650	46.5	10,000
		TOTAL ACRES	5,350	53.5			4,650	46.5	10,000
GRAND TOTAL			676,380	66.8	8,230	.8	328,130	32.4	1,012,740


EVERETT
SEATTLE
TACOMA
FORT LEWIS
OLYMPIA
CHELAN
WENATCHEE
SPOKANE
Mtn. Rainier
Yakima
Naches
Columbia River
Snake River
Cowlitz
Kelso
Mt. Adams
Pasco
Prosser
Dayton
Asotin
Walla Walla
Elgin
Wallowa
Enterprise
Joseph
Vancouver
Portland
Mt. Hood
Arlington
Pendleton
Willow Cr.
Condon
Fossil
Kinzua
La Grande
Union
Minam
Snake River
Salem
Deschutes
Madras
Bend
Corvallis
Willamette
Eugene
Cottage Grove
Waterman
John Day
Canyon City
Ochoco
Baker
Burns
Roseburg
Coos Bay
Grants Pass
Medford
Ashland
Klamath Falls
Brookings
Newport
Malheur River
Deschutes River
Willamette River
Mt. Hood
Mt. Jefferson
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SPRUCE BUDWORM INFESTATION IN OREGON & WASHINGTON
PREPARED BY: OREGON STATE BOARD OF FORESTRY - SALEM, OREGON
CONTROL PROGRAM PROPOSED FOR 1951
CONTROLLED IN 1949 & 1950
TO BE CONTROLLED IN 1951
INFESTED - NO CONTROL IN 1951
(12) OCHOCO - NUMBER AND NAME OF CONTROL UNIT
SOURCE: COOPERATIVE SURVEY - FALL OF 1950